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Title: Analyzing Black Hole X-Rays with Simulations

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Analyzing Black Hole X-Rays with Simulations

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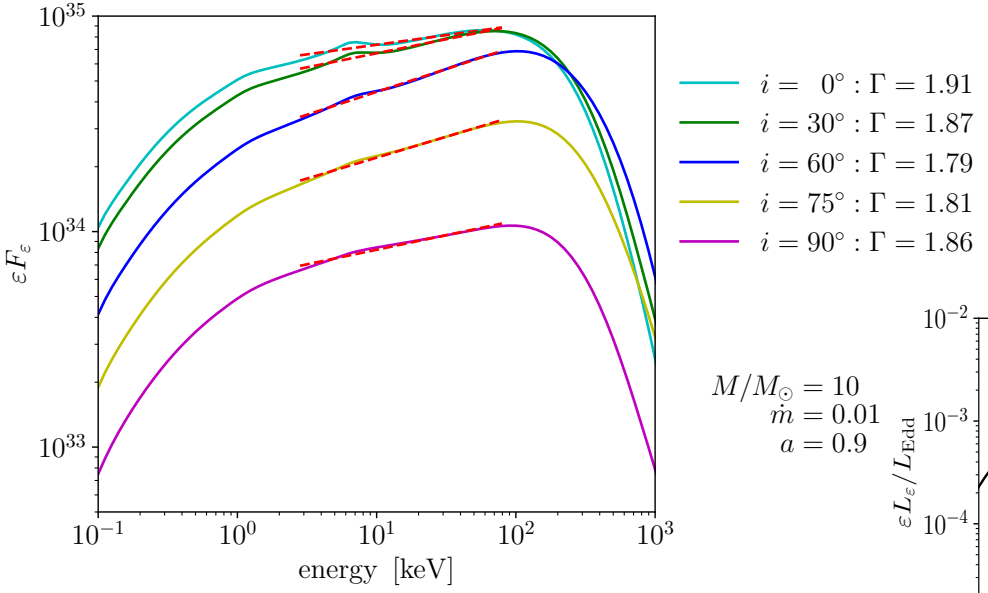
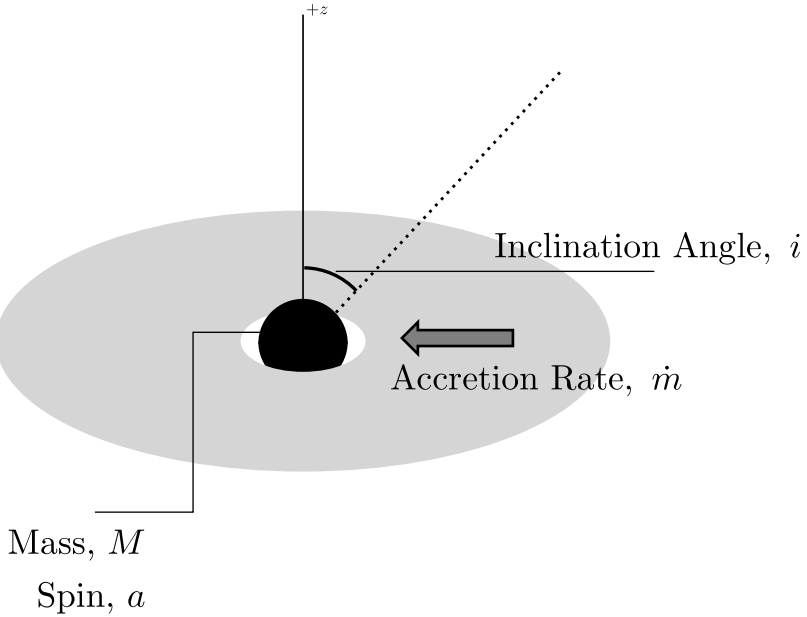
We generate synthetic X-ray spectra of black holes from large-scale 3D GRMHD simulations performed on HPC machines.

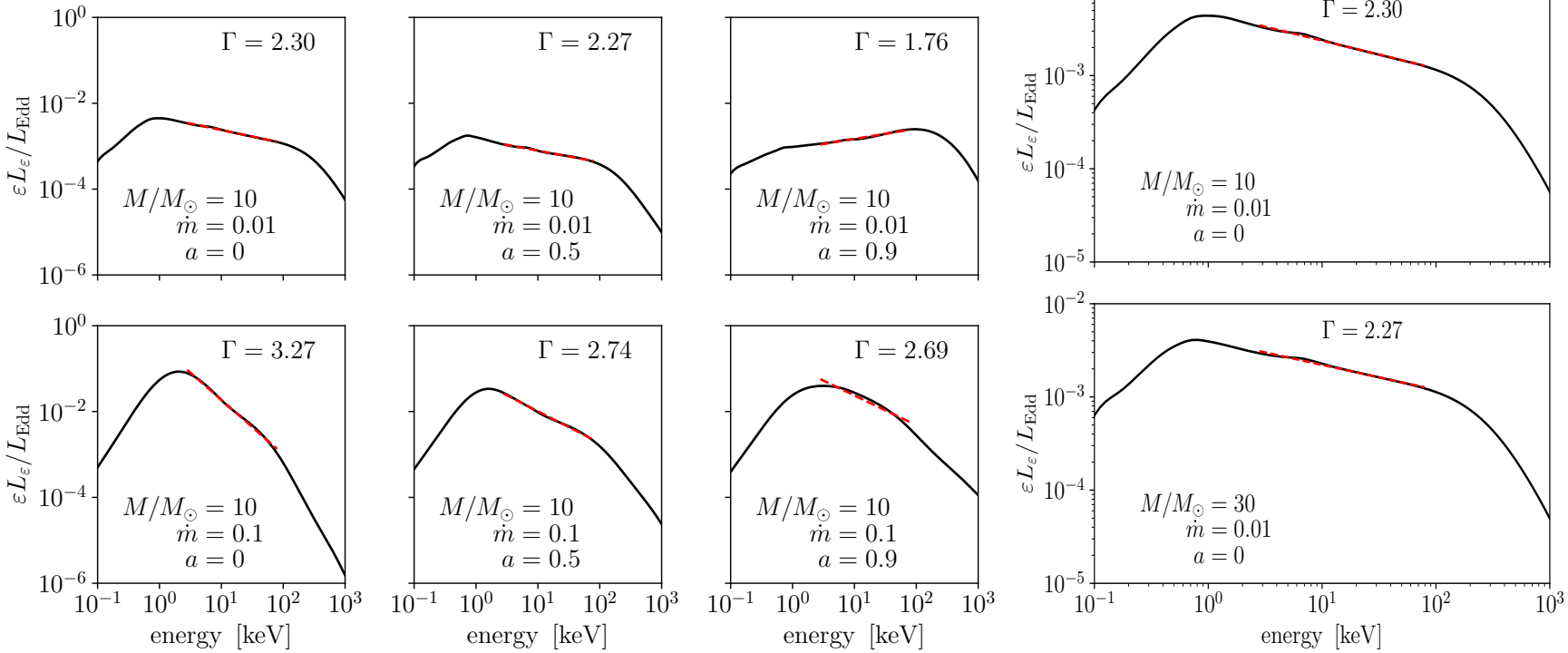
Here are a sampling of model spectra, characterized by the parameters indicated in the diagram below. The dashed red lines show power law fits to the parts of the spectrum observed by the X-ray telescope NuSTAR.

How well these model spectra compare to real data helps us to characterize the physical realism of the underlying simulation techniques.



$$F_\nu/\nu \propto \nu^{-\Gamma}$$





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